Montana Department of Environmental Quality Comments on Phase I Site Characterization Data Summary Report; Columbia Falls Aluminum Company; Columbia Falls, Flathead County, Montana (February 27, 2017)

General Comments by MDEQ in black. Responses provided by CFAC/Roux Associates in Red.

1.) Please identify the location of Aluminum City on appropriate site maps and figures (e.g., Figures 1 and 2, Plate 1).

The location of Aluminum City will be noted on Figures 1 and 2, and Plate 1.

2.) On the appropriate Plates and/or Figures, please identify the surface water feature that originates east of the Industrial Landfill and flows south to an area between the Industrial Landfill and the North-West Percolation Pond. Ensure that discussion of this feature, and any associated sample results, are included in the appropriate sections of the report (i.e. sections 2.11.3, 2.12, 3.6, 3.7, 4.2.2, etc.).

The surface water feature referenced in Comment #2 will be noted on the appropriate Plates and/or Figures if not already noted. This feature and sampling results will be discussed in the noted sections as appropriate.

3.) Please add a section to the Phase I Characterization Data Summary Report summarizing all identified data gaps. Included in that summary, provide a general discussion of how missing information will be addressed in the Phase II Sampling and Analysis Plan, details on the purpose, general approach and methods for the investigation. This section should include, for example, those data gaps identified in section 3.3.2.1, a proposed method to clearly establish water-table contours in the western area of the site near Aluminum City, suggested collection of additional soil and sediment data to determine the source of contamination detected in Cedar Creek, etc.

In addition, a thorough data gap analysis must be conducted for all data summarized in Section 4. All identified data gaps must be included in the new section. While some data gaps are described in the individual area descriptions in Section 4, it is important to clearly summarize all gaps found during the Phase I evaluation.

CFAC and Roux Associates recognize the importance of identifying data gaps. The Phase I Data Summary Report was intended to summarize data and present an overall view of the Site conditions. As discussed during our project meeting on April 18, 2017, data gaps will be identified in the Phase II Sampling and Analysis Plan, where the full scope of work for Phase II will be presented.

4.) While the data collected were focused on investigating the historical operation area, it is important to also investigate where contamination may have come to exist in other areas on the site and ensure the data is spatially representative of the entire site. In order to refine the list of COPCs for the site, a more thorough investigation must be completed to identify "worst case" scenarios and identify areas of the site that may have been impacted beyond the operational footprint. At this time there is insufficient data to justify permanently removing compounds as COPCs for the site. Removing compounds prior to fully

characterizing a site can lead to the elimination of potential risks. Additional investigations should be conducted within the suspected source areas until clean, non-impacted media, has been reached to better define the extent of contamination and ensure the highest concentration of each contaminant is known.

As stated in the RI/FS Work Plan, one of the objectives for Phase I Site Characterization Program was to refine the list of COPCs that require further investigation so lists of laboratory analyses can be reduced during subsequent phases of investigation. Also, as stated in Section 4.1.5 of the draft Phase I Summary Report, "identification of which COPCs will be retained for further evaluation in the risk assessment process and included in the Phase II Site Characterization program will occur during development of the Baseline Risk Assessment Work Plan (BRAWP) and the Phase II Site Characterization Sampling and Analysis Plan." The process for screening COPCs is outlined in the RI/FS Work Plan and Phase I SAP. Roux disagrees that the Site must be fully characterized before beginning to screen COPCs. Rather, a sufficient understanding of the types and concentrations of COPCs needs to be developed based upon knowledge of historical Site operations and investigation of potential source areas where the highest concentrations of COPCS would be expected to be present. The Phase I Site Characterization was designed to generate sufficient information to permit the screening of COPCs, where appropriate, based upon the process outlined in the RI/FS Work Plan. As described in responses to USEPA comments, screening of COPCs from further evaluation will not begin until all four rounds of groundwater and surface water sampling specified in the Phase I Sampling and Analysis Plan are complete.

Data gaps and the work required to address those gaps will be evaluated and developed during preparation of the Phase II Sampling and Analysis Plan. It is acknowledged that additional vertical and horizontal delineation will be required in some areas to better define the extent of contamination.

5.) Leaching to groundwater exceedances must be discussed throughout Section 4 of this document. Numerous discussions linking soil concentrations to groundwater contamination were included based on exceedances of residential and/or industrial screening levels. For example, section 4.1.2 notes that the Former Drum Storage Area may be a contributing source to elevated cyanide and fluoride in groundwater due to soil concentrations exceeding residential and industrial screening levels. These screening levels are based on direct contact and therefore do not represent the risks that soil contaminants may or may not pose on groundwater. Please include a discussion of leaching to groundwater potential throughout Section 4 to evaluate the leaching pathway this should include any compounds that may have exceed leaching to groundwater but may not have exceed residential or industrial RSLs.

Similar comments were also noted by USEPA. Additional language will be added throughout Section 4.0 of the Phase I Data Summary Report that discusses exceedances of the Protection of Groundwater Risk-Based Soil Screening Levels.

6.) A list of Phase I organic and inorganic analytes with analytical methods and screening levels should be included as a Table.

An evaluation of method detection limits will be added to Section 3.8 of the Phase I Data Summary Report. The method detection limit evaluation will include a table with minimum, maximum, mean, and median detection limits compared to all screening criteria evaluated in the Phase I Data Summary Report.

7.) Potential contamination within the Main Plant Area has not been adequately characterized. Soil and groundwater sampling should be conducted in the Main Plant Area, once the demolition project has been completed. Soil and groundwater beneath the building basements and foundations, prior to placement of fill, should also be sampled. Characterization within the Main Plant Area must be identified as a data gap and included in the data gap analysis section, per Comment 3 above.

Investigation beneath the Main Plant Area has previously been discussed with the project team. It is acknowledged that this investigation must occur. This will be identified as a data gap and a scope of work will be included in the Phase II Sampling and Analysis Plan as described in the response to Comment #3 above.

8.) The Operational Area was sampled using a grid/composite sample approach. Sample results indicate elevated concentrations of PAHs and inorganic compounds are present greater than residential and industrial regional screening levels. Additional discrete sampling must be conducted in the Operational Area to further delineate soil contamination in surface, shallow, and at depth soils.

As noted in the Phase I Sampling and Analysis Plan and shown in the results of the Site-wide soil boring activities, approximately 16 discrete soil borings were completed within the Operational Area as a complement to the ISM sampling. These discrete borings were completed in surface, shallow, and at intermediate depth intervals. Concentrations measured in the Operational Area using the ISM approach and the discrete sampling approach were similar (i.e., elevated PAHs and inorganic compounds greater than USEPA Industrial and Residential RSLS).

Any additional discrete sampling that may be required in the Operational Area will be discussed in the Phase II Sampling and Analysis Plan.

9.) Calbag Resources, the company conducting demolition of the aluminum facility, has taken soil, waste, and waste residue samples for demolition and waste management purposes. Sampling will also be conducted in the interior of the building and the basements as part of closure requirements. Analytical results of these samples may provide useful information.

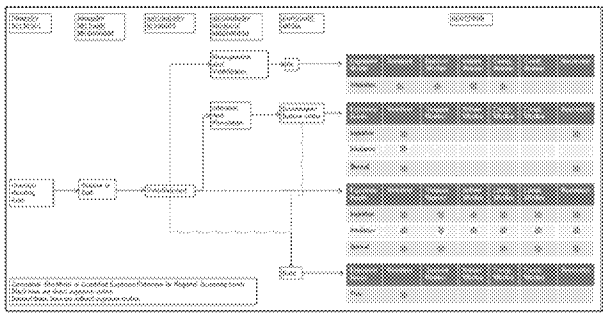
Roux Associates, on behalf of CFAC, submitted a Concrete Sampling and Analysis Plan to USEPA in August 2016. The Concrete Sampling and Analysis Plan describes the planned sampling of concrete in the building and basements and planned data evaluation. This sampling will occur throughout 2017 and will be reported to the USEPA in separate letter reports.

Any additional sampling that is being conducted by Calbag to satisfy the Waste Management Plan is part of the waste disposal process. Any data collected by Calbag is Calbag's responsibility to report to the MDEQ.

10.) Please add a figure showing an updated Conceptual Site Model for the site. This figure should include sources, affected medium, exposure points, exposure routes, and receptors. See the example figure below.

CFAC and Roux Associates plan to update and discuss the Conceptual Site Model figure in the Baseline Human Health and Ecological Risk Assessment Work Plan to be submitted in 2017 following approval of

the Phase I Data Summary Report. In addition, an updated Conceptual Site Model figure for ecological exposure pathways will included in the SLERA Summary Report.



11.) The current 400 mg/kg RSL is based on the United States Department of Health and Human Services' Center for Disease Control and Prevention (CDC) and EPA's adopted 10 microgram per deciliter (µg/dL) PbB concentration of concern. In 2012, the CDC released an updated reference level for PbB of 5 µg/dL; however, the EPA has yet to adopt that level for risk assessments. In order to be protective of both adults and children in a residential scenario and minimize the possibility of having to conduct additional remedial actions to address lead, DEQ has developed a lead cleanup level of 153 mg/kg which is based upon the 5µg/dL endpoint. Please revise the lead screening level in all applicable tables and re-evaluate lead as a COPC for the site in the text where needed.

The lead cleanup level developed by MDEQ is acknowledged and it is understood that the USEPA has yet to adopt that level for risk assessments; however, the RI/FS for the CFAC Site is being governed by the USEPA. The approved RI/FS Work Plan (which is included as part of the Administrative Order on Consent between CFAC and USEPA) notes the screening levels that are required for the Site. The work completed in the Phase I Data Summary Report compares to the data to those screening levels in accordance with the Work Plan and AOC requirements. The MDEQ screening level will be considered during the development of the HHRAWP and associated COPC screening process.

12.) Screening Levels: Please note that DEQ considers an additional or excess lifetime cancer risk of 1 in 100,000 (1×10^{-5}) an allowable risk for persons exposed to cancer-causing compounds. To help users make the appropriate adjustments to the EPA RSLs, DEQ developed a soil screening flow chart (http://deq.mt.gov/Portals/112/Land/StateSuperFund/Documents/SoilScreenFlowchart2016.pdf?ver=2016-05-19-153548-370) to evaluate direct contact and leaching to groundwater in surface and subsurface soils. Please apply the procedures outlined in this chart to determine the appropriate screening levels for soil samples at the Columbia Falls Aluminum Company Site.

The RI/FS for the CFAC Site is being governed by the USEPA. The approved RI/FS Work Plan (which is included as part of the Administrative Order on Consent between CFAC and USEPA) notes the screening levels that are required for the Site. The work completed in the Phase I Data Summary Report compares the data to those screening levels in accordance with the Work Plan and AOC requirements.

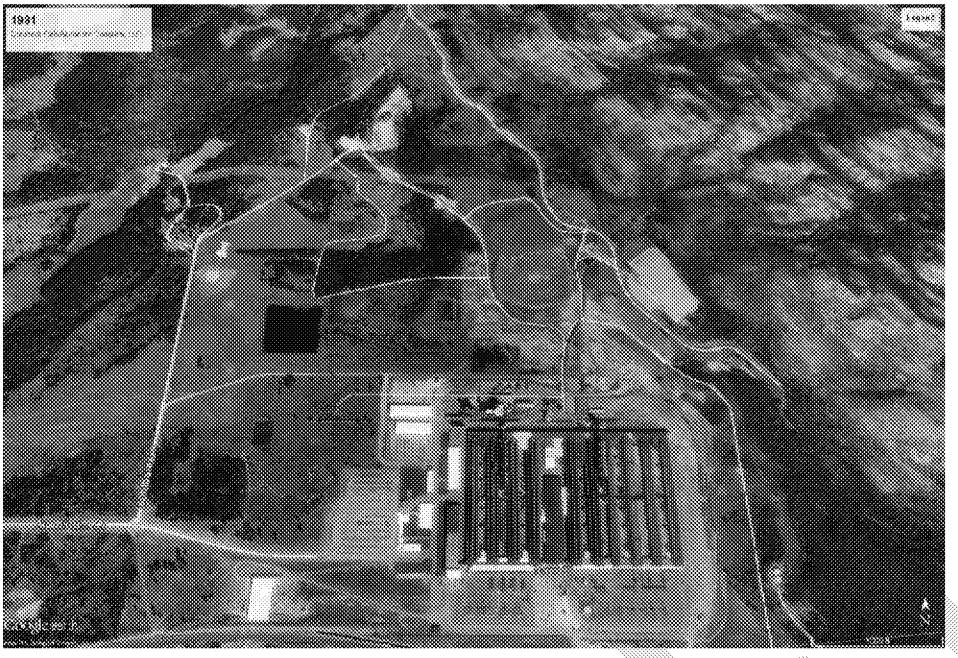
13.) The samples chosen to represent background concentrations are insufficient. According to EPA's Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites "the locations of the background samples must be areas that could not have received contamination from the site". The

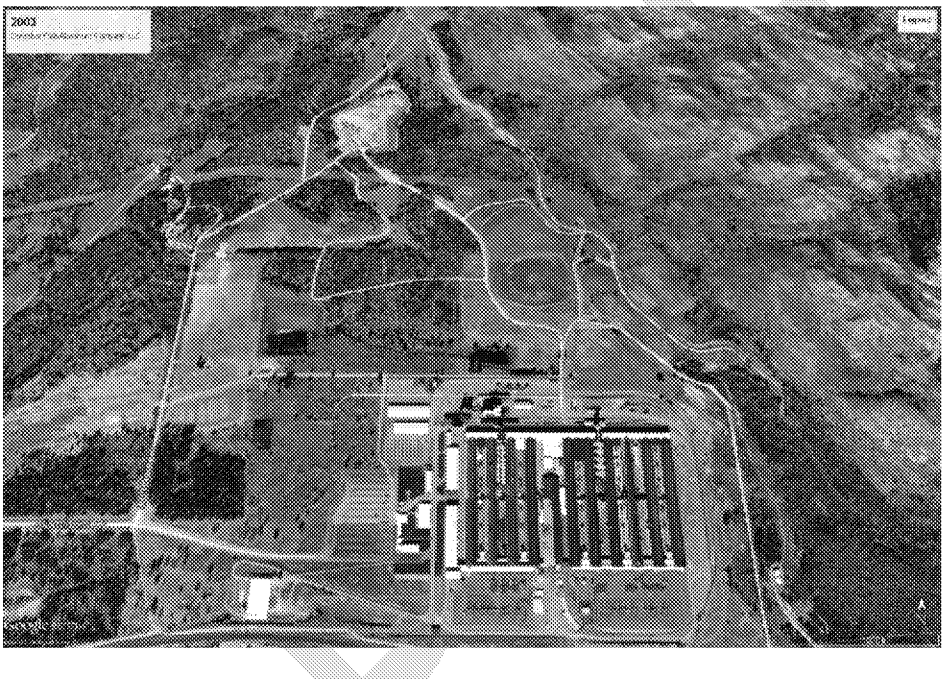
samples collected for background comparisons were collected from an area within site boundaries, and adjacent to known sources of contamination (North Percolation Pond Area & the Industrial Landfill) where wind, runoff or other activities could have had a negative impact on the area.

Google Earth also shows evidence of the area being used during operations (presence of a building in 1991 imagery) and previously disturbed by human activity in 2003 and 2004 (see images below). Please conduct preliminary screening of metals using background concentrations provided in the DEQ Background Concentrations of Inorganic Constituents in Montana Surface Soils (http://deq.mt.gov/Portals/112/Land/StateSuperfund/Documents/InorganicBackground/BkgdInorganicsReport.pdf). A more appropriate site-specific background evaluation may be conducted at a future date if needed.

The locations selected for the background study, including eight soil sampling locations, as well as upstream / upgradient groundwater and surface water / sediment locations, were approved by the USEPA for use during the Phase I Site Characterization as part of the RI/FS Work Plan. These locations were selected because they were not in areas used during historical manufacturing operations or for waste disposal based upon aerial photography reviewed during preparation of the RI/FS Work Plan. The disturbances showed on the photography provided by MDEQ in Comment #13 is a softball field that was used by CFAC employees. No manufacturing operations or waste disposal activities were conducted in the area.

It is recognized that the background area could have received contamination from the Site via wind (i.e. aerial deposition). We believe that it is highly unlikely that runoff, or other methods, reached the background soil area, or up gradient sample locations, based on Site topography and our understanding of the Site. It also should be noted that concentrations of key Site COPCs, including cyanide, fluoride, and PAHs, are typically less than residential screening level values in the background soil area. There is also the possibility that these concentrations are background levels. Regardless, the background area utilized for the Phase I Site characterization is primarily being used to compare against metals for which background levels are widely reported in literature. In fact, the results of the metals were screened against the DEQ background report. It is included in Section 3.4.4.4. The need for development of any additional background studies will be evaluated during development of the BRAWP and Phase II SAP, and if needed later during the RI/FS Process.





Specific Comments by MDEQ in black. Responses provided by CFAC/Roux Associates in Red.

1. Section 1.1, page 2: As part of site background and historical information in support of the site conceptual model, please describe the nature and use of the of the rectangular re-forested areas visible on aerial photos and located northwest of the northeast Percolation Pond and southwest of Former Drum Storage Area, and the rectangular re-forested area west of Main Plant Area.

   The rectangular re-forested areas referenced in Comment #1 are areas where CFAC conducted historical studies of tree growth as part of its evaluation of fluoride emissions. These locations were not part of Site

operations. CFAC/Roux Associates does not feel this additional information needs to be included in the Phase I Data Summary Report, as it is not pertinent to evaluation of the nature and extent of COPCs at the Site.

2. Section 2.4.4.1, page 8 – Landfill Soil Gas Screening: Field screening for soil gas was not conducted at the East Landfill. Please include a statement in this section explaining why.

   Field screening of soil gas was not completed at the East Landfill due to the existence of an engineered cap at the East Landfill. A statement will be added to Section 2.4.4.1.

3. Section 2.10.2, page 17: Please provide all asbestos test pit logs, including any photos or other field notes, and a copy of the asbestos report submitted by Hydrometrics.

   A table summarizing the test pit findings will be added to Section 2.10.2. This information was also reported to USEPA in Progress Report #6 (August 2016). Photos of the test pitting activities were included in Appendix A as photos #39 and #40. Additional photos will be added to Appendix A of the asbestos test pitting activities. Hydrometrics did not prepare an asbestos report. Hydrometrics' asbestos inspector was onsite to help identify if asbestos was present in each test pit location.

4. Section 2.12: Discussion on the depth of sediment sampling along the river should be included in the report. There may be a significant data gap if sediment sampling was not conducted within the hyporheic zone.

   Section 2.12 will be modified to note that in locations where depositional sediment was found in surface water bodies, samples were generally collected approximately three to five feet from the bank of the feature, beneath the water. Samples were generally collected from the top inch of the depositional sediment. However, as noted in the Phase I Summary Report, most of the locations within the Flathead River and the Cedar Creek Drainage Overflow Ditch did not contain depositional sediment. Where soil was found instead of sediment, samples were collected in the same manner as described above. The objective of the sediment sampling when preparing the RI/FS work plan was focused on evaluating potential exposure. This objective aligns with the sample collection methods/depths described above that were conducted during the Phase I Site Characterization.

   Hyporheic sampling is primarily utilized to evaluate potential groundwater-sediment-surface water discharge pathways (i.e., fate and transport). Porewater within the hyporheic zone would be an appropriate medium for sampling to evaluate the fate and transport pathway or potential exposure to microbial communities. Porewater sampling will be included in the Phase II investigation, as noted in the RI/FS Work Plan.

5. Section 2.12, page 24: Include reference to the sediment samples (CF-SDP-021 and 022) collected from sediment associated with the surface water feature referred to as the Northern Surface Water Feature in Section 2.11.3. These sample locations are indicated on Plate 5, but the samples are not reflected on Table 5 and results are not indicated in Appendix Y. Please describe why these samples were collected, but no results reported.

As described in Section 2.12, not all proposed sediment sample locations contained unconsolidated materials that meet the technical definition of sediment. During sampling, Roux Associates personnel utilized a probing rod and visual inspections to evaluate the presence of sediment. Accumulations of loose, unconsolidated, bedded sediments were only identified at locations within Cedar Creek, the North and South Percolation Ponds, the Backwater Seep Sampling Area of the Flathead River, and one location within Flathead River. The remaining proposed sample locations, including the locations in the Northern Surface Water Feature did not appear to be sediment. At the proposed sampling locations where sediments were absent, a surface soil sample was collected and noted as such on the sample field data sheets. The locations are color coded on Plate 5 as noted in the legend to identify where soil samples were collected and where sediment samples were collected. The data from CFSDP-021 and 022 are included in Appendix L.

6. Section 3.3.2, page 36: Provide a description and discussion of the surface water feature indicated on numerous Plates and Figures (e.g., Plates 1 and 2, Figures 2 and 3) apparently originating east of the Industrial Landfill and flowing south to an area between the Industrial Landfill and the North-West Percolation Pond. Include any information known regarding the source and historical diversion of flow (i.e. it appears to have been diverted into a ditch flowing west to Cedar Creek).

   Additional information about the Northern Surface Water Feature will be included in Section 3.3.2.2. Roux Associates performed reconnaissance of the surface water feature during the summer of 2016. No evidence of a ditch or other evidence indicating a historical diversion of water to Cedar Creek was identified. The surface water feature was delineated using GPS and the extent is shown on Figures and Plates throughout the Phase I Data Summary Report.

7. Section 3.3.2.4, page 42: Please reference Plate 12 in this section, as the discharge measurement points are shown on this figure.

   Plate 12 will be referenced in Section 3.3.2.4.

8. Section 3.4.1, page 46, 1st paragraph on page: Please note that any leaching to groundwater exceedances must be investigated even if the compound was not found in groundwater or exceeded EPA RSLs. At this stage in the investigation any future potential for a compound to leach should be recorded and evaluated further. Leaching can often drive the clean-up levels for certain compounds at a site as well as future remedial action alternatives. It is permissible to adjust the EPA RBSSL using the flow chart provided in General Comment 12 above as well as background concentrations provided in General Comment 13. Please include a statement indicating that all leaching to groundwater exceedances will be carried forward and evaluated further.

   As described in the response to general comment #5 above, similar comments were also noted by USEPA regarding the USEPA Protection of Groundwater Risk-Based Soil Screening Levels. Additional language will be added throughout the Phase I Data Summary Report that discusses exceedances of the Protection of Groundwater Risk-Based Soil Screening Levels. All exceedances of the USEPA Protection of Groundwater RBSSLs will be carried forward for further evaluation in the Human Health Risk Assessment Work Plan.

As described in the response to general comment #12 above, the RI/FS for the CFAC Site is being governed by the USEPA. The approved RI/FS Work Plan (which is included as part of the Administrative Order on Consent between CFAC and USEPA) notes the screening levels that are required for the Site. The work completed in the Phase I Data Summary Report compares to the data to those screening levels in accordance with the Work Plan and AOC requirements. Therefore, the screening levels will not be adjusted for the Phase I Data Summary Report. Further evaluation of COPCs and screening levels will be evaluated in the HHRAWP.

9. Section 3.4.1.3, page 48 – Site-Wide Metals, second bullet: Refer to the General Comment above regarding the appropriate screening level for lead. The EPA regional screening level (RSL) for lead is 400 mg/kg. In 2012, the CDC released an updated reference level for lead blood (PbB) concentration of 5 microgram per deciliter (µg/dL); however, the EPA has yet to adopt that level for risk assessments. DEQ developed a lead cleanup level of 153 mg/kg, based on the 5 µg/dL endpoint. DEQ uses this new lead level in risk assessments in order to be protective of both adults and children in a residential scenario and to minimize the possibility of additional remedial actions in the future to address lead.

   The lead cleanup level developed by MDEQ is acknowledged and it is understood that the USEPA has yet to adopt that level for risk assessments; however, as described in the response to general comment #12 above, the RI/FS for the CFAC Site is being governed by the USEPA. The approved RI/FS Work Plan (which is included as part of the Administrative Order on Consent between CFAC and USEPA) notes the screening levels that are required for the Site. The work completed in the Phase I Data Summary Report compares the data to those screening levels in accordance with the Work Plan and AOC requirements. The MDEQ screening level will be considered during the development of the HHRAWP and associated COPC screening process.

10. Section 3.4.1.4, page 48: The methodology for calculating Toxicity Equivalent Factors (TEFs) in the referenced documents (EPA "Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessment) has not been applied correctly. The assigned TEF values for individual compounds should be multiplied by the concentration of the individual congener (see Equation 1 of the reference EPA document). The TEQ is then calculated by summing these products. This TEQ value is then evaluated using TCDD dose-response data and used to assess the risk. DEQ developed a DEQ Dioxin/Furan calculator applying the referenced equations. Please rescreen all Dioxin/Furan data using this calculator and the referenced methodology to ensure the screening process is properly conducted (http://deq.mt.gov/Land/statesuperfund/teqs).

    The dioxin-furan data will be rescreened and Section 3.4.1.4 will be modified accordingly.

11. Section 3.4.1.4, page 48 – Dioxins (PCDDs) and Dibenzofurans (PCDFs): According to the RI/FS Work Plan, releases of PCBs occurred in the Rectifier Yards as a result of spills and transformer fires in 1991 and 1994. It appears, from the Phase I Report, that samples from the Rectifier Yards were analyzed for PCDDs and PCDFs; no PCB compounds were evaluated. PCB analysis of soil in the Rectifier Yards must be conducted, or additional information should be included in this section stating the reasons for not analyzing samples for PCBs.

All Site-wide soil samples were analyzed for PCBs, including the samples collected within the Rectifier Yards (shown on Plate 2). Section 3.4.1 notes that PCBs and pesticides were not detected in any of the discrete soil samples collected during the Phase I Site Characterization. This includes all locations within the Rectifier Yards.

12. Section 3.4.2.2, page 52 – Operational Area PAHs: Composite sampling indicates presence of PAHs in surface and shallow soils greater than residential and industrial screening levels. Additional sampling should be conducted to identify extent and magnitude of PAHs in soils. This information may be most appropriately discussed in a new section where data gaps and plans for additional Phase II sampling are summarized.

    As noted in the response to general comment #8 above, concentrations measured in the Operational Area using the ISM approach were similar to concentrations in discrete soil samples from the 16 borings distributed throughout the Operational Area, as well as the numerous borings around the Main Plant area and around the other areas of the Site where operations occurred. Elevated PAH concentrations greater than USEPA Industrial and Residential RSLS were observed in most soil samples across the Operational and Main Plant Area.

    A data gap analysis and the sampling proposed to address the identified gaps will be presented in the Phase II SAP.

13. Section 3.4.3, page 55 – Drainage Structure Soil Quality: For clarity, the location of the drainage structures should be included in this section. Analytical results should be shown on a corresponding map, in addition to the analytical results tables.

    Section 3.4.3 will be modified to note that the locations of the drainage structure sampling are shown on Plate 2. Thematic soil maps will be added to Appendix N for the drainage structure samples.

14. Section 3.4.4, page 57 – Background Area Soil Quality: Also refer to the General Comment above regarding background sampling locations. Background samples indicate some PAH concentrations above USEPA Residential RSLs. While the location chosen for background samples may be upwind of historical plant emissions for prevalent westerly wind patterns, the location does experience air inversions and likely down-river east winds. Information on PAH concentrations outside the main areas of plant activities may be useful. However, air deposition of PAHs in soils from aluminum production is common and should be considered in any evaluation of PAH concentrations in background soil samples. If background PAH samples are necessary for evaluation, alternative samples should be taken that are at locations outside the area influenced by air deposition.

    As noted in Section 3.4.4.4 and as specified in the preliminary conceptual Site model within the RI/FS Work Plan, cyanide, fluoride, and SVOCs were presumed to be primary COPCs at the Site based upon knowledge of historical Site operations and the results of prior investigations. This presumption has been further confirmed based upon the concentrations of these COPCs detected in soil within Site features at various locations across the Site; as well as, in the case of cyanide and fluoride, in groundwater as described in Section 3.5. Therefore, cyanide, fluoride, and PAHs were intentionally not included in the statistical evaluation of the Background Area soil quality for this Data Summary Report.

It is recognized that these analytes were detected in the background area. However, it is difficult to make conclusions regarding the potential source(s) of cyanide, fluoride, and PAHs at in the background area this time. The detected concentrations are typically low (below Residential RSLs) and it is understood that these analytes will remain COPCs moving forward.

15. Section 3.5.2.1: Due to the high exceedances of cyanide and fluoride near the West Landfill/Former Drum Storage Area, DEQ would recommend the installation of at least one additional well directly downgradient from the from the Former Drum Storage Area. This information may be most appropriately discussed in a new section where data gaps and plans for additional Phase II sampling are summarized.

    As discussed previously throughout these responses, the scope of the Phase II investigation will be presented in the Phase II Sampling and Analysis Plan. All data gaps will be considered at that time and will take into consideration additional sampling/drilling that may be required.

16. Section 3.5.2.1: Discussion on the speciation of cyanide in groundwater should be included in this report. If speciation of cyanide in groundwater has not been investigated, discussion should be included as to why it is not necessary.

    Free cyanide is being analyzed in Round 3 and Round 4 of groundwater and surface water sampling activities at all locations where cyanide was detected in Rounds 1 or 2. The results of this sampling will be summarized in the Groundwater and Surface Water Data Summary Report planned to be completed following completion of all four rounds of sampling (late 2017). These results will be further evaluated in the preparation of the Baseline Risk Assessment Work Plans to determine if any further speciation analysis is warranted during the Phase II work.

17. Section 3.4.5, page 62, 2nd paragraph: The referenced tables in Appendix L (L25 and L30) do not appear to include VOC and SVOC results for the soil samples from the 0-0.5 ft interval. Ensure these results are included on the tables and in the surface soil quality evaluation discussions for the borrow area, as this interval has been stockpiled and will be replaced on the surface in this area of the site.

    VOCs were not collected in any surface soil samples (0 – 0.5 ft-bls) throughout the Phase I Site Characterization in accordance with the RI/FS Work Plan. SVOC results for the 0-0.5 ft-bls interval are provided in Appendix L, Plate L26.

18. Section 3.4.5, page 63, last paragraph, last sentence: Refer to the comment above regarding future replacement of surface soils in the borrow area. Although surface soils will not be used as borrow material, the results must be included in the soil quality evaluation, as these sample results provide characterization data for surface soils in this area of the site.

    Additional language will be added to Section 3.4.5 to discuss the surface sample results and soil quality evaluation in the Borrow Pit Area.

19. Section 3.4.5, page 64: Please include a column in this table with Mean concentrations for metals from the soil 0-0.5 ft samples, as this soil has been stockpiled and will be replaced/remain on site in the borrow area. These soil results provide characterization data for surface soils in this area of the site.

A column for mean concentrations for metals from the 0-0.5 ft-bls interval will be added to the table in Section 3.4.5.

20. Section 3.5.2, page 69: Previous planning documents (RI/FS Work Plan, Phase I SAP, or Phase I SAP Addendum) did not indicate that the VISL calculator would be used to evaluate soil vapor or soil gas samples. The only screening values mentioned were EPA RSLs (pg. 62 RI/FS Work Plan). The VISL calculator includes generic attenuation factors such as 0.03 for subslab to indoor air. It also includes chemical-specific attenuation factors for groundwater to indoor air. DEQ has not determined that these attenuation factors are appropriate for general use. The VISL also includes a risk calculator that does explicitly account for cumulative risks and that should not be used for a building by building risk calculation. Please evaluate the soil vapor and/or soil gas sample results against the EPA RSLs, as described on p. 62 of the RI/FS Work Plan. The results of this evaluation should also be included in Section 4.2.3.

    The RI/FS Work Plan identifies the USEPA Vapor Intrusion Screening Level (VISL) Calculator (USEPA, June 2015) in Section 3.6.1 regarding Chemical-Specific ARARs and TBCs. No other RSLs were noted in the RI/FS Work Plan or Phase I SAP/SAP Addendum. CFAC/Roux Associates feels that the screening was completed in accordance with the planning documents.

21. Section 3.7, page 24: Refer to comment for section 2.12 above and describe why results are not included for sediment samples CF-SDP-021 and CF-SDP-022.

    As described above in response to comment #5, not all proposed sediment sample locations contained unconsolidated materials that meet the technical definition of sediment. At the proposed sampling locations where sediments were absent, a surface soil sample was collected and noted as such on the sample field data sheets. The locations are color coded on Plate 5 as noted in the legend to identify where soil samples were collected and where sediment samples were collected. The data from CFSDP-021 and 022 are included in Appendix L.

22. Section 4.1.3, page 86:
    a. 2nd paragraph – Soils at depth should also be compared to leaching to groundwater screening levels to evaluate the potential for contaminants to impact groundwater. Please include a discussion of leaching to groundwater. Refer to General Comment 5 above.
       A discussion of the USEPA Protection of Groundwater Risk-Based Soil Screening levels will be added to the referenced paragraph.

    b. 4th paragraph – Please include a discussion of leaching to groundwater exceedances, if any, in soil samples within the Northwest and Northeast Percolation Pond. Please remove the statement noting the Northwest and Northeast Percolation Ponds "effectively prevent migration of SVOC's from the ponds to groundwater" or provide evidence that the ponds were engineered and constructed to prevent leaching to groundwater. If leaching to groundwater screening levels are exceeded and there is no other evidence (presence of pond liners, etc.) to suggest that these ponds were constructed to "prevent migration of SVOC's to groundwater" then the potential for future leaching should be evaluated.

A discussion of the USEPA Protection of Groundwater Risk-Based Soil Screening levels will be added. The statement regarding the migration of SVOCs will be removed.

23. Section 4.1.4, page 87, 1st paragraph: It would be helpful to reference a figure in this section that indicates the locations of the drywells/drainage structures and the ASTs and USTs referenced, as well as the associated sampling locations. In addition, refer to General Comment 3 above, and describe whether additional sampling is needed to fully identify and characterize the contaminant sources in these areas. This information may be most appropriately discussed in a new section where data gaps and plans for additional Phase II sampling are summarized.

    A figure will be referenced in Section 4.1.4 to note the locations of the drainage structures and the ASTs/USTs. As described in the responses above, a data gap analysis and the sampling proposed to address the identified gaps will be presented in the Phase II SAP.

24. Section 4.1.5, page 89, 2nd paragraph, last sentence: The sentence states that free cyanide analysis will be included in future sampling events to address the uncertainty between total cyanide analysis and free cyanide analysis due to potential metal-cyanide complexes. To obtain the concentration of strong metal-cyanide complexes, free cyanide and weak acid dissociable (CNwad) concentrations should be subtracted from the total cyanide concentration. In addition, thiocyanates are not part of the total cyanide concentration (Gagnon, et. al.).

    The USEPA regional screening levels for cyanide are based on free cyanide. During rounds 3 and 4 of groundwater and surface water sampling, both total and free cyanide analysis will be completed in accordance with the Phase I SAP Modification # 9, which was submitted to USEPA on March 2, 2017 and approved by the USEPA via email correspondence on March 7, 2017. CFAC/Roux Associates believe that for the purposes of screening at this time, the strong metal-cyanide complexes are not necessary. As discussed in response to comment #16, these results will be further evaluated in the preparation of the Baseline Risk Assessment Work Plans to determine if any further speciation analysis is warranted during the Phase II work.

25. Section 4.1.5.1, page 89, second paragraph on page: If VOCs exceeded soil screening levels, including leaching to groundwater, then they should be retained as COCs for the site and evaluated further in the Baseline Risk Assessment. Please include a discussion of leaching to groundwater and retain those compounds that exceed EPA RSLs or leaching screening levels as COCs.

    The entire Section 4.0 of the Data Summary Report is designed to summarize for the reader what the Phase I results are indicating in the context of the Conceptual Site Model which will continue to be updated as the RI proceeds. It was not intended that any of the statements in Section 4.0 be taken as final conclusions of the RI. Also, as stated in Section 4.1.5 of the draft Phase I Summary Report, "identification of which COPCs will be retained for further evaluation in the risk assessment process and included in the Phase II Site Characterization program will occur during development of the Baseline Risk Assessment Work Plan (BRAWP) and the Phase II Site Characterization Sampling and Analysis Plan. Therefore, CFAC and Roux Associates agree that screening of COPCs from further evaluation will not be

performed until all four rounds of sampling specified in the Phase I Sampling and Analysis Plan are complete.

Section 4.5.1 will be modified to include further discussion of the data relative to the Protection of Groundwater Risk-Based Soil Screening levels.

26. Section 4.1.5.2, page 90: Please refer to General Comment 13 above regarding site specific background concentrations.

    Please see the response to general comment #13 above.

27. Section 4.2, Page 91: Are there plans to evaluate areas downwind of property boundary? Please provide a discussion of any plans to complete an evaluation of downwind properties. This information may be most appropriately discussed in a new section where data gaps and plans for additional Phase II sampling are summarized.

    The scope of work for the Phase I Site Characterization was defined in the RI/FS Work Plan, approved by the USEPA, and included as part of the AOC. The Phase I Data Summary Report summarizes the work completed as part of the Phase I Site Characterization. Any future work planned for the Phase II investigation will be documented as part of the data gap analysis in the Phase II Sampling and Analysis Plan.

28. Section 4.2.1, page 93, last paragraph: Although PAHs were not seen above Groundwater standards the potential for future leaching should be noted. Please include a statement that the potential for PAHs to leach to groundwater will be investigated and evaluated further during the Phase II investigation and Baseline Risk Assessment.

    A discussion of the data relative to the USEPA Protection of Groundwater Risk-Based Soil Screening Levels will be added to the referenced paragraph in Section 4.2.1 and it will be noted that PAHs will continue to be evaluated during Phase II and the baseline risk assessment.

29. Section 4.2.1, Page 92, second paragraph and Section 4.2.2, Page 95, last paragraph: Include a discussion of the quarterly data collected from Aluminum City as referenced in this section. Include information regarding the sampling methods and a table indicating sample results.

    The quarterly data collected as part of the Aluminum City sampling work is not officially part of the RI/FS process; however, the value of this data is recognized. A section summarizing the data, including the sampling methods and a table indicating the results, will be added in the results section of the Phase I Data Summary Report. A summary of the data will also be added in Section 4.2.1 as referenced in the comment.

30. Section 4.2.1, Page 93, first paragraph: Please add figures showing arsenic, lead, aluminum, cobalt, and iron contours to illustrate this discussion.

As noted in Section 4.2.1 and depicted on the thematic groundwater maps in Appendix V, the elevated concentrations of metals in groundwater are generally limited to the three or four wells located immediately downgradient of the landfills and do not extend in the southern direction like the dissolved cyanide or fluoride. As such, preparation of iso-concentrations were not prepared for these metals, as they do not provide any significant support to the data evaluation.

31. Tables 21 and 22: Table 21 and 22 include columns labeled "CFMW-001 Standard". CFMW-001 is a background value and should not be confused with a determined standard. Please remove the term 'standard' from the CFMW-001 columns.

    Tables 21 and 22 will be revised as requested in the comment.

32. Figure 2. The plant drainage structures described in the RI/FS Work Plan and in Sections 2.4.5 and 3.4.3 of the Phase 1 Report should be shown on Figure 2 or on a separate map.

    The drainage structure locations which were evaluated during the Phase I Site Characterization are shown on Plates 1 and 2.

33. Plate 2: Please include the sample locations and designations for all soil gas samples to help interpret analytical data and field data sheets.

    Soil gas sample locations and designations are shown on Figures 4 and 5. These locations will not be added to Plate 2, as Plate 2 is a map of soil sampling locations.

34. Appendix C "Field Data Sheets", Soil Gas Screening, Soil Gas Sampling Sheet dated 4/21/2016: Notes were added to the 2nd page of the sampling sheet indicating the presence of black soil and black sludge at about 1 ft bgs. Please provide the location of samples CFSGS-011 to CFSGS-013 and provide text within the report explaining what, if anything was done to further investigate the presence of this sludge material.

    The location of CFSGS-011 to CFSGS-013 are shown on Figure 4. These locations are soil gas locations within the Wet Scrubber Sludge Pond Landfill. The material that was encountered are materials that are present beneath the surface of the landfill. The contents of the landfills were not investigated as part of the Phase I Site Characterization and therefore nothing further was done to investigate this material. However, the sludge material is expected to be present everywhere beneath the surface of the Wet Scrubber Sludge Pond, hence the name.

References

Gagnon, I., Zagury, G., and Deschênes, L. (2004). Natural Attenuation Potential of Cyanide Near a SPL Landfill. *Proceedings of the 8th International Symposium on Environmental Issues and Management of Waste in Energy and Mineral Production SWEMP* (p.p. 451-456) Ankara, Turkey. http://www.polymtl.ca/enviro-geremi/pdf/articles/Paper_Gagnon_Zagury_et_al_Jan_15_2004%20.pdf